Chapter 3 Changing Climates

An interesting place to visit in Alberta is the town of Okotoks, located south of Calgary. The name Okotoks comes from the Blackfoot name *okatoks*, which means "rock." The name is certainly fitting because one of the town's biggest tourist attractions is a house-sized rock, shown on these two pages, sitting in the middle of a farmer's field. Big Rock, as it is called, is 41 m long, 18 m wide, 9 m high, and weighs 16 500 tonnes. For centuries it has been a famous landmark that helped First Nations travellers find an important river crossing. Each Nation has a different name for the crossing. The Sarcee Nation calls it *chachosika*, meaning "valley of the big rock." The Stoney Nation calls it *ipabitunga-ingay*, meaning "where the big rock is."

People of the Blackfoot Nation even have a story to explain the origin of the mysterious rock. As the story goes, one of the first people to live in the area was Napi, also known as The Great Spirit. Napi was strolling through what is now Waterton Lakes National Park in southwestern Alberta. Along the way, he loaned his coat to a large rock. When the rock refused to return the coat, Napi grabbed the coat back. Enraged, the rock chased Napi across the prairie. Fearing for his life, Napi sought the help of his animal friends. In Napi's defence, flocks of birds descended, chipping away at the rock, until finally a nighthawk struck it dead where it now lies. Later in this chapter you will learn the scientific explanation of how Big Rock got to be where it is. You will learn that it did, in fact, travel a great distance to finally rest at its present location in the middle of a farmer's field.

By the end of this chapter you will be able to generally describe the major characteristics and life forms of Alberta during the last 65 million years, cite evidence that Alberta has gone through repeated glaciations, and explain and evaluate theories concerning the causes of historical climate change. As well, you will know how to describe how concepts, models, and theories concerning climate change are combined with modern technology to predict future global climate changes.

Try This Activity

Ice Flows!

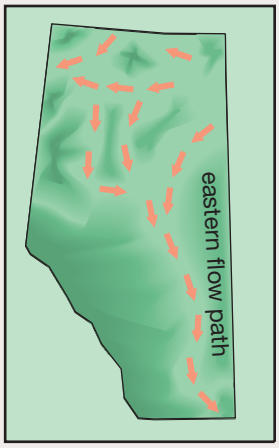
Science Skills

✓ Analyzing and Interpreting

Background

Scientists believe that during the last two million years, ice sheets advanced across most of Canada and then receded. This cycle was repeated many times. These icy periods are called glaciations. The last glaciation covered most of Alberta, reaching farthest south into northern Montana approximately 18 000 years ago. As the continental glaciers advanced and retreated, they shaped the land, much like water flowing over a beach shapes the sand. As water moves, it can carry sediment. Moving ice can carry giant boulders.

The Last Glaciation



Analysis

In groups, attempt to answer questions 1 to 5.

1. "The Last Glaciation" is a topographical map of Alberta showing the shape of the land's surface. Figure C3.1 is a photo of a wet, sandy beach. Describe any similarities you can see.
2. Explain what might have caused these similarities.
3. Explain how the comparison in question 2 is an example of uniformitarianism.
4. Look again at the photo of Big Rock on these two pages. The rock is made of quartzite, a material usually found only in the Rocky Mountains. Hypothesize the source of Big Rock, which is the largest rock in North America that was moved a great distance by a glacier.
5. Describe the path taken by Big Rock to its final resting place. Attempt to explain why Big Rock followed the path it did.

Figure C3.1: Like water flowing over a beach shapes sand, advancing and retreating glaciers shape land.